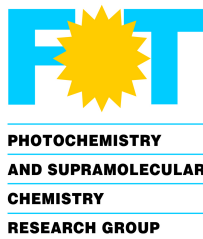


Department of Chemistry

Study of systems with response to different stimuli

Photochemistry and Supramolecular Chemistry Group



Raquel Castell

- PhD in Chemistry from University Jaume I (Castellón, Spain).
- Since 2009 post-doc position at the Photochemistry and Supramolecular Chemistry Research Group.
- 18 publications in international peer reviewed journals.

Objectives

The research activity is focused on the following topics:

- Development of new **photochromic** and **thermochromic** systems based on **flavylium compounds**.
- Development of new **multi-stimuli responsive polymers** based on the functionalization of **poly(*N*-isopropylacrylamide)** with **flavylium** moieties.
- Synthesis and study of new **alkynyl gold(I) complexes** with **luminescent properties**.

Methodology

- Study of the thermodynamics and kinetics of the pH-dependent network of chemical reactions of flavylium compounds and its behaviour under the action of additional stimuli such as light and/or temperature.
- Synthesis of new multi-stimuli responsive polymers based on the co-polymerization of *N*-isopropylacrylamide with vinyl-derivatized flavylium compounds. Alternatively, grafting of flavylium compounds on a pre-formed poly(*N*-isopropylacrylamide)-type polymer.
- Synthesis of new water soluble alkynyl gold(I) complexes and study of their gelation and luminescent properties. Effect of the addition of different anions and cations.

Expected Results

- Development of new photochromic systems in aqueous solution, with good contrast between switching colours (from yellow to red) and reasonable stability (**Figure 1**).
- Development of a new phase-change thermochromic system which switches from colourless to blue at a temperature around 16 °C in *n*-pentadecanonitrile (**Figure 2**).
- Development of new multi-stimuli responsive polymers with response to temperature, pH and light (**Figure 3**).
- Development of new luminescent hydrogels and new sensors for anions and cations, based on alkynyl gold(I) compounds (**Figure 4**).

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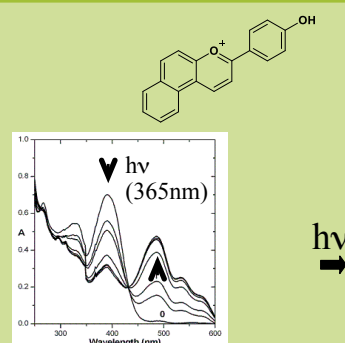
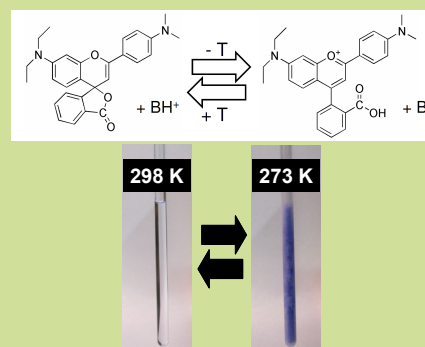
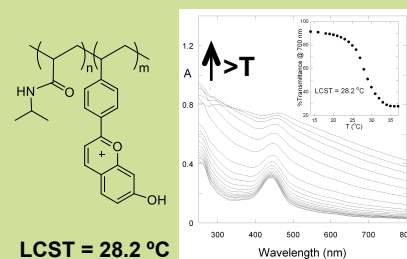


Figure 1



n-Pentadecanonitrile

Figure 2



LCST = 28.2 °C

Figure 3

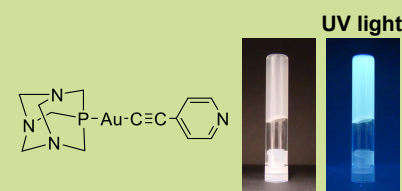


Figure 4